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June 1989

approach

The Naval Aviation Safety Review

Approach Goes Low!

Flying Low

By Stephen Coonts

Low level flight is as old as aviation. After their first 3-foot-high hop, Wilbur and Orville spent most of their creative time and effort trying to get *out* of the regime we define as "low-level." No fools they. Instinctively, they knew that Daedalus had been full of bull: The safest place for those who followed Icarus was the open sky, way up there above the trees, above the birds, above the power lines and church steeples and odious Li'l Abners with their squirrel rifles.

Alas, the designers had just figured out how to get their airplanes safely away from the ground when the military discovered how useful they were right above the treetops. As soon as airplanes could lift machine guns, some early airman — his name now lost to us — decided to give the louts in the mud who were firing at him a taste of their own medicine. He stuffed his biplane into a dive, struts and wires humming, machine gun hammering, and pulled out just above the enemy trenches. Even his cavalry superiors with their spurs were impressed with the gruesome results. By the summer of 1916, some Royal Flying Corps thinker had dubbed this type of work "infantry contact patrol" and put it on the flight schedule, just in time for the First Battle of the Somme.

Military aviators have been down in the weeds ever since. It's a challenging place to be, as close to combat as you can get without a war.

Besides the hazards of beanpoles, Cessnas and the obstacles mentioned above, a new, merciless dimension is added to every facet of aviation when your airspeed is a number larger than the radar altimeter reading. Every twitch of the stick has an ominously greater significance for your continued existence. Any equipment malfunction must be dealt with without the luxury of time that altitude gives. The range of radar, nav aids and radio communications shrivels near the earth. Navigation ceases to be an interesting problem that amuses and instructs; its riddles and enigmas become as unforgiving as cloud-shrouded granite. Fuel becomes extraordinarily precious when your resources are melting faster than the Devil's popsicle.

Darkness? Aha! Do it at night below 500 feet and you will have your first significant religious experience. The word "darkness" for you will henceforth have mystical, mythological overtones.

Low-level flight will challenge you more than any other training mission in aviation. If you use your head, you'll become a better pilot. If you don't use your head, you won't be with us long.

Mr. Coonts is the best-selling author of *Flight of the Intruder* and *Final Flight*. He flew A-6s in Vietnam, and later served as a catapult and arresting gear officer aboard USS *Nimitz* (CVN-68) before leaving active duty in 1977. He recently retired from the Naval Reserve as a commander. His story, "The World's Greatest Attack Pilot," appeared in the August 1987 issue of Approach. Mr. Coonts' latest novel "Minotaur" signals the return of Jake Grafton and will be released this fall.

Back in the States, Jake Grafton had taken great pleasure in flights like this along training routes over stretches of wilderness where the legal altitude was a minimum of 500 feet above the ground. Being young and full of himself, he often flew as low as his nerves allowed just for the sheer hell of it. In those days, when military planes were still permitted to fly under visual flight rules, he would occasionally return to NAS Whidbey Island over the Cascade Range at 200 or 300 feet above the floor of the craggy valleys, shoot through the passes at full throttle and snake his way down between the cliffs, following the streams until they emptied into rivers that flowed into Puget Sound. He had wondered what the hikers had thought of the man-made eagle that split the solitude with a roar, then disappeared as quickly as it had come. Higher authority had finally stopped the illegal flights. Now he was glad he had had the experience. — ***Flight of the Intruder***, U.S. Naval Institute, Annapolis, Md. 1986.

inside approach

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NAS NORFOLK, VA

Moonlight Intruders. VA-35 A-6s ingress toward their target in North Vietnam. By Craig Kodera. c 1988. The Greenwich Workshop, Trumbull, Conn.

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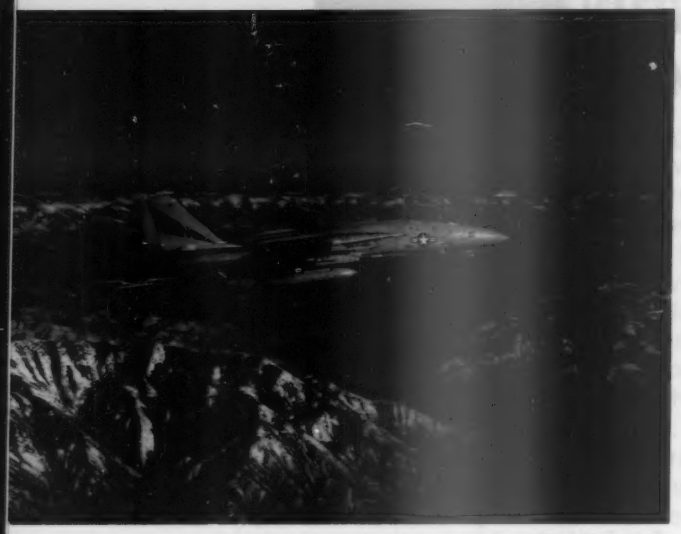
Needed Now:

The New, Improved Low Altitude Training Program



By Capt. Robert M. Adkisson, USMC

Case 1. You've just laid a string of Mk. 83s on target from a Hornet High Pop. Your heart races as you switch to the assigned A/A radar coverage and go low. You've got to get below the SAM envelope, *now!* You're in a 20-degree dive at 450 knots, and the radar altimeter shows 1,200 feet AGL. Is it time to pull out, or can you press lower to avoid the SAMs?

Case 2. Now you're on an armed road recce, traveling through a valley with mountainous terrain on both sides. You spot two six-bys with towed guns at your 2 o'clock.

"Tally two right, 2 o'clock low . . . one's in hot!"

From 4,000 feet AGL, 420 knots and less than 90 degree of turn to go, how low can you place your nose for this attack?

Case 3. You're at 50 feet AGL, staying below the SAM threat. Suddenly you spot a gun flash at your 10 o'clock just as your RHAW gear comes alive. You jink into the vertical to deny the threat and find yourself in a 25-degree climb. What is the fastest way to get back down without hitting the ground?

TACAIR pilots need answers to these questions, but traditional low altitude training (LAT) fails to provide them. It focuses on relatively static minimum altitudes and comfort levels, and not on aircraft or pilot performance in tactical situations or flight regimes. Traditional LAT is not concerned with dynamic maneuvers, either.

One promising solution is the improved LAT program adapted from the Arizona Air National Guard by LCdr. Bill Gortney and Capt. Doug Yurovich, USMC, of VFA-125, the West Coast F/A-18 FRS. Using these techniques, VFA-125 has been training CAT I pilots down to 100 feet AGL for over a year.

The improved LAT program provides a way to train and fight more safely at low altitude. It builds confidence and teaches pilots to maintain situational awareness (SA) while providing a substantial safety buffer. The program applies to other aircraft, too. After fleet indoctrination, VFA-113 qualified an F-14 TARPS crew from VF-154 in the new LAT program. (See accompanying sidebar)

The new LAT program is taught in a highly structured syllabus with ground, simulator and flight training phases. The program teaches the pilot what to look for, when to look for it, where to use it and how to use it. Pilots are taught the underlying physics and aerodynamics that define the low altitude operating envelope along with visual perceptions and subtle weaknesses inherent in central and peripheral vision. Most important, pilots learn the concept of task management. Simply put: Avoid the dirt, *then* do the mission.

The program focuses on five factors that affect tasking level in the cockpit. Avoiding the ground is always the first priority, and accomplishing the mission is second. Let's examine the basics.

1. Maneuver. This factor involves actual aircraft

parameters of bank angle, G, altitude, airspeed and dive angle. Pilot control of any one of these variables changes the level of effort needed to avoid the ground.

2. Aircraft capability. The status of the airframe, engine and electronics needed to accomplish the mission. Do the HUD, RADALT and other mission-critical items work?

3. Pilot and aircrew capability. This factor includes flight currency, preparation, attitude and basic stick-and-rudder skills. Are the pilot and aircrew prepared for the sortie?

4. Environment. What is the terrain like? How about weather and visibility? Is the training to be conducted in familiar terrain or in a new environment?

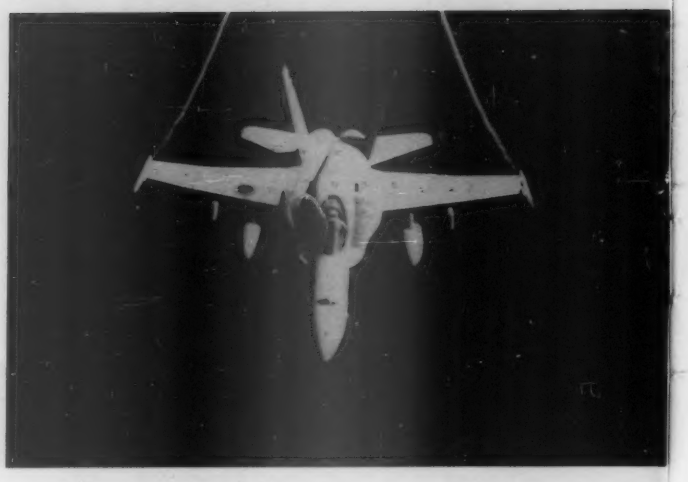
5. Tasking. How low do you have to go? How high do you have to go? And when? What altitudes are required to perform the mission, to avoid the threat, to find the target, and then to deliver the weapons with the required impact angles and avoid frag damage?

By changing any of these variables, the level of effort for ground avoidance also changes, affecting the pilot's level of confidence and aggressiveness. For example, assume the aircraft is mission capable, the pilot is well prepared, and the environment is familiar terrain and good weather. Tasking is determined by weapons — yours and his. Maneuvering then becomes the dominant variable that the pilot must control to adjust how much attention he must give in the cockpit to avoid the ground. If the terrain is unfamiliar, or if the pilot is not as good as he needs to be, the equation changes, causing the pilot to modify his maneuvers. LAT teaches a methodical approach during preflight analysis.

Standard low altitude vertical maneuvers are at the heart of the new LAT program. These maneuvers are divided into three groups:

1. Steady State Dives. Dives from altitude, preparing for low-level target ingress.

2. High-Low Transitions. Banked roll-ins from a base altitude.



3. Low-High-Low Transitions. Pop-up attacks.

Specific ways have been devised to quickly and easily control flight path and altitude to prevent ground impact while tactically maneuvering to accomplish the mission. Here are three rules to live by.

Steady-State Dive Recovery. This rule provides a stairstep recovery schedule to a minimum altitude of 200 feet AGL. An onset rate of 4 G's in two seconds and an airspeed of 420 KCAS are assumed. In the F/A-18, aircraft direction of flight is read from the velocity vector on the HUD. The velocity vector provides actual aircraft flight path angle, that is, exactly where the aircraft is going, regardless of nose pitch angle. In a hard pullout, aircraft nose attitude normally leads the actual climbout. "Mushing" through a pullout is a familiar example of this phenomenon. At higher speeds, nose attitude and flight path are roughly coincident, with lag most noticeable during commencement of hard maneuvering.

Because the ground can be best avoided by knowing precisely where the aircraft is headed at any given time, the usefulness of a velocity vector to provide instantaneous flight path angle becomes evident. Aircraft altitude (MSL or AGL) and airspeed are also displayed on the F/A-18 HUD, making it especially well-suited to performance cross-checks during contact flying. (See Figure 1.) The dive recovery rule schedule is based on the velocity vector. It must be memorized.

BASIC FLIGHT DATA

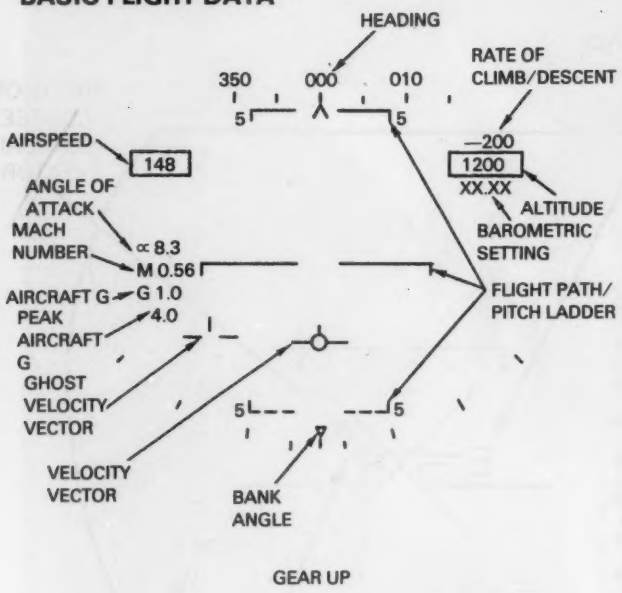


Figure 1

For example, in a 25-degree nose low dive, when you reach 1,500 feet, you pull the velocity vector back to -15 degrees (skipping the next checkpoint) until you reach 750 feet. Then, you pull to -5 degrees (again skipping the intermediate checkpoint) until you reach 250 feet. (See Figure 2.) After

Flight Path Angle (Degrees)	Start Recovery AGL (Feet)
-5	250
-10	500
-15	750
-20	1,000
-25	1,500

Figure 2

reaching this last checkpoint, you pull the velocity vector to the horizon for level flight. The result is a rapid descent to minimum altitude. Geometrically, the recovery resembles a stop sign. While not mathematically correct, 1,500 feet is used because it is easier to scan than 1,250 feet. In practice, the pilot memorizes the schedule and talks it out to himself during the recovery.

"25 for 15...15 for 750...5 for 250," or "20 for 10...10 for 5."

Using this rule, let's return to Case 1. You're in a 20-degree dive at 450 knots, and your radar altimeter indicates 1,200 feet AGL. You can safely press to 1,000 feet AGL, then reset attitude to 10-degrees nose low until 500 feet AGL, then get back to level flight for a bottom-out altitude of 200 feet AGL. You will have safely achieved minimum altitude in minimum time with a minimum of mental gymnastics.

The dive recovery is powerful and effective, not just for planned maneuvers, but for unplanned situations as well. With it, the crew can quickly calculate how far to press any attitude or altitude situation, and as a result, low altitude safety is significantly enhanced.

50 Percent Rule. This rule is used for targets of opportunity and high-low vertical transitions. It provides the maximum safe dive angle for a 90-degree turning roll-in based on 420 knots airspeed.

5,000 feet AGL . . . 25 degrees nose low maximum

4,000 feet AGL . . . 20 degrees nose low maximum

3,000 feet AGL . . . 15 degrees nose low maximum

2,000 feet AGL . . . 10 degrees nose low maximum

Maximum dive angle is equal to half the AGL altitude in hundreds of feet. The rule helps prevent overcommitting the nose low during a roll-in and allows the crew to quickly decide if the dive angle is too steep. It also teaches discipline in cross-checking AGL altitude prior to the roll-in. Less than 90 degrees of turn prior to roll-in gives an altitude buffer as you approach the dive recovery; more than 90 degrees reduces the buffer. Once you crack the horizon, you're on the dive recovery schedule for that angle.

Let's return to Case 2 and see how this rule applies to a target of opportunity on an armed road recce. If the fighter is at 4,000 feet AGL and the target is just passing his 1-to-2 o'clock position, the

Continued on page 7

F-14 LAT Application

In a memorandum to Commander, Fighter Airborne Early Warning Wing, Pacific, VF-154 advocated the need for the F-14 community to train for real-world low altitude tactical threats. Without the capability of operating in this environment, the memo said, squadron aircrews could not fully exploit the capabilities of their aircraft. An answer came from within CVW-14, from the Stingers of VFA-113. VFA-113 had become the first fleet squadron to implement the new F/A-18 LAT program and to have a designated LAT instructor. Working together, the Stingers and Black Knights of VF-154 tailored the program to the F-14, which has an earlier generation HUD without an easily readable airspeed and altitude display. (See Figure 3.) Crew coordination in the Tomcat provided the solution. F-14 crews were able to successfully compensate by dividing responsibilities and working together as a team. The Tomcat crews used the landing mode of their HUD for nose attitude determination with the pitch ladder and VDI. The RIO monitored flight parameters while the pilot controlled the aircraft. Radio discipline was critical in maintaining the altitude safety buffer. Precise calls such as "steep," "shallow," "fast" and "slow," proved invaluable.

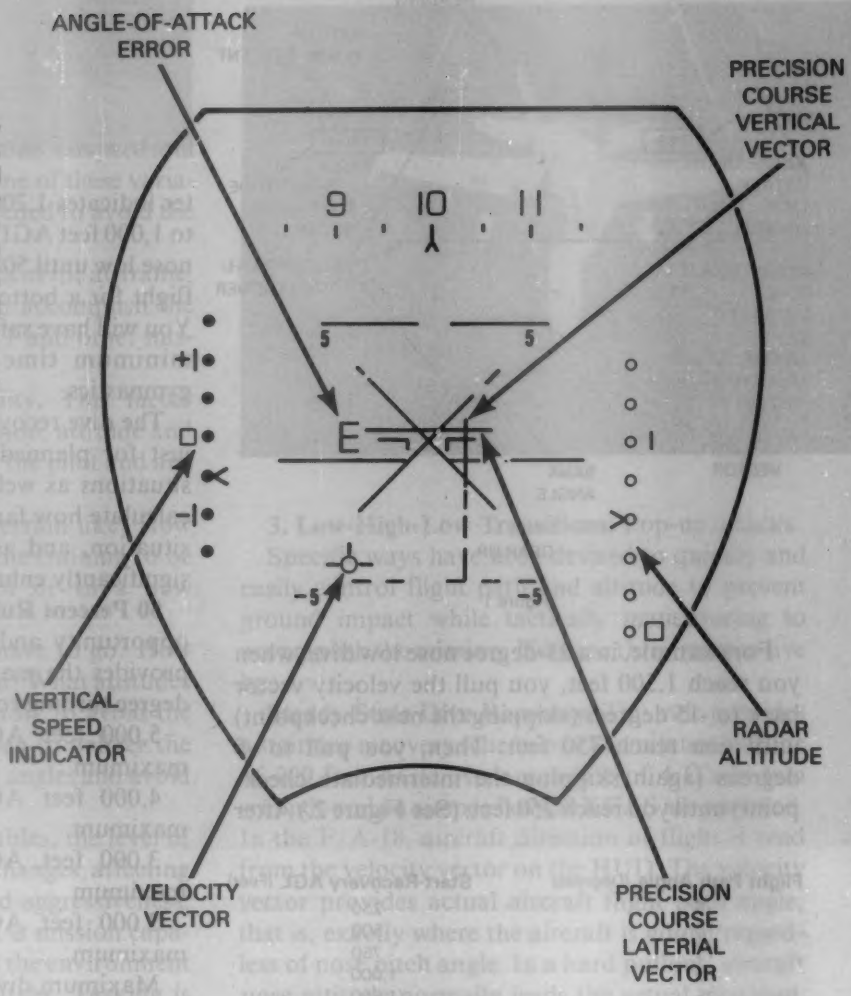


Figure 3

Graphics By Frank L. Smith

Initial F-14 simulator training in the 2F112/2F95 provided proof of the concept. Further training of F-14 crews in the F/A-18 2F132 visual simulator domes demonstrated visual and aural low altitude warnings as well as increased task loading at low altitude. Coordinated techniques were repeatedly rehearsed.

Dive Recovery Rule, as adapted to the F-14. The RIO calls out the appropriate dive recovery window for that particular maneuver. As the aircraft approaches the recovery window altitude, the RIO calls "pull" and the pilot begins a 4-G/two-second backstick application to the next window. Two pull calls are followed by an "abort" call.

50 Percent Rule. The RIO calls attitude and airspeed to help the pilot adjust his initial sight picture. For example, if the pilot had maneuvered his aircraft from 4,000 feet AGL and settled out at 25 degrees nose low and 480 knots, the RIO would call "steep and fast." The pilot would respond by resetting nose attitude. If the pilot does not respond, the RIO makes a "pull" call followed by a "10 for 5" call to the next dive recovery rule window.

10 Degree Rule. Prior to nose commit, the RIO notes the maximum climb angle. After nose commit, the RIO makes standard advisory and mandatory recovery calls.

Crew coordination and flight preparation are instrumental to the success of the program. VF-154 proved that the program works well for the Tomcat. F-14 squadrons that want to implement a LAT program should contact VFA-113 (currently deployed) or the VFA-125 Training Department at NAS Lemoore.

LCdr. Dave Parsons

fighter can safely roll in 20 degrees nose low for 1,000 feet AGL and pick up the rest of the step-down recovery to a level altitude of 200 feet AGL.

10 Degree Rule. This is "dead reckoning" for vertical pop-up maneuvers. Using the 10-degree rule, your maximum dive angle is your maximum climb angle minus 10 degrees. Begin pullout at or before a time equal to the time spent in the climb. Although it is a great tool in a pinch, the pilot must be cognizant of two limitations: G onset on the pullout must be greater than pullup G onset, and the rule works only between 10 degrees minimum and 30 degrees maximum.

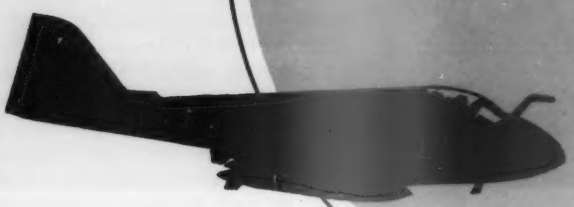
Returning to Case 3, your fighter is in a 25-degree climb. Your maximum dive angle is, therefore, 15 degrees.

The LAT program rules we discussed allow aircrew to fully exploit the operating envelope of their aircraft while avoiding the ground. The rules teach the following:

What to look for
— AGL
— Dive angle
When to look for it
— in the dive
— prior to rolling in
— during the pulldown
Where to find it
— HUD
— RADALT
— BARALT
How to use it
— to establish the dive
— on the pullout ◄

Capt. Adkisson is a Marine Corps fighter pilot on exchange duty with VFA-113 in USS *Constellation* (CV-64). He serves as squadron NATOPS officer and LSO. His previous tour was as an F/A-18 instructor with VFA-125, the West Coast Hornet FRS.

There's a First Time for Everything



By Lt. Bob Papadakis

MY first WESTPAC deployment was a series of "firsts." It was my first cruise as a CAT I bombardier/navigator. USS *Enterprise* (CVN-65) was my first carrier. We were the first nuclear-powered carrier to transit the Suez Canal. For the first time in recent memory, West Coast A-6 squadrons would have the opportunity to train frequently in a low-level environment on this six-month deployment. It was over the vine-laden hillsides of Sicily when I experienced my first engine fire light.

. . . I heard the pilot say, "We're outta here! We've got a fire light!" My left hand immediately found the IFF and rotated the knob to the emergency position . . .

I was one half of an all-CAT I crew. I had flown with my pilot in the RAG, and we requested to be crewed together for the cruise. Although our combined A-6 hours barely approached the sums logged by one of the "old guys" who flew A-6s before the earth was cool, we felt comfortable flying together. We backed each other up during the briefs, preflights and every phase of flight.

We were scheduled to fly on the wing of the XO and our safety officer. Our two planes would separate before route entry. Both aircrew had flown the route earlier in the day and would fly single-plane night Search Radar Terrain Clearance (SRTC) for a day-night, low-level qual. Brief, preflight, man-up, launch and rendezvous all went smoothly. The en route phase lasted 10 minutes.

After we received clearance, we detached from the lead and established a "feet-wet" orbit five miles from point alpha. The lead reported "point alpha," and we began our ingress after completing our next turn. We would gauge our separation throughout the hop by using the UHF turn-point calls. The first two legs went smoothly. Near turn-point charlie, I ducked my head back into the hood after scanning the left side of the cockpit.

I was amazed at the clarity of the radar picture. The little town of Mineo boomed as a bright amber square just past my cursor intersection. I wish I could have thanked Mineo's forefathers for building so many square buildings at the peak of the lonely hill. We would be clear of the terrain through the first portion of the turn.

As I keyed the ICS to inform my pilot of this, I felt my head pressed into the hood. At the same time, I heard my pilot say, "We're outta here! We've got a fire light!"

My left hand immediately found the IFF and rotated the knob to the emergency position. We soon had someone's attention. My PCL already in hand, my pilot and I double-checked all NATOPS procedures for "fire warning light illuminated."

My pilot had quickly completed all bold-faced procedures when he saw the left fire light illuminate. We continued the single-engine climb to 13,500 feet MSL — far away from the dark, unforgiving earth. I secured the Detection Ranging Set (DRS) since it was the only electronic gear I considered unnecessary during this emergency. (I would rather power it up for proper stowage during our field arrestment.)

Once we had gained some altitude, we established positive comms with Catania Approach. I told the controller that we were declaring an emergency and climbing "Victor Mike Charlie" to 13,500 feet. The controller was very helpful at this point, and he did not overload us with trivial questions. He merely confirmed our emergency status and told us that we were "positive radar contact." Once level, we executed a few gentle turns to check our trail of smoke. Good, no dark contrails.

We contacted Catania Approach and told them that we were single engine and requested a precision approach to NAS Sigonella. Our prebriefed emergency divert was now on the nose at 25 miles. We also requested an LSO, the fresnel lens, and told them that we would take the short-field gear.

We had already begun dumping down to single-engine landing weight, a weight that we triple checked. The horror story of an overweight single-engine A-6 settling uncontrollably on approach was fresh in both our minds. Chalk one up for safety AOMs.

We descended under radar control and read through the single-engine approach procedures, checking and rechecking all of the steps. We both scanned the engine gauges as we had never scanned before. My radar picture was reassuring. Only tame hills lay between us and the field. Then the radar quit. One of the seven major indicators of a bleed air failure: multiple unrelated electrical failures. At this point I was positive that one of my old RAG instructors was tucked away in the turtleback pulling wires and flipping switches. I casually mentioned the failure between VSI calls and replies to the PAR controller. My pilot answered, "Roger, is your flashlight ready?"

He was obviously thinking of the same RAG instructor. I trained the red light beam on the VGI. The ADI called it quits soon after the radar. By now we were at two miles, checklists were complete, and the flashing approach lights of runway 10R loomed sweetly in our windscreen. We picked up the ball at three-quarters of a mile, and my pilot flew a textbook pass to touchdown.

The postflight inspection by maintenance personnel discovered a frayed pigtail in the fire warning element. There were no bleed air leaks. My first encounter with the light was a successful one. Although this was one of many firsts for me on cruise, I know that it certainly was not the first time that "the little blue book" helped bring an ailing aircraft and its crew safely home. ◄

Lt. Papadakis is an A-6 B/N with VA-95, based at NAS Whidbey Island, Wash.

Not Quite South

By AMEC(AW) J.R. Wallace

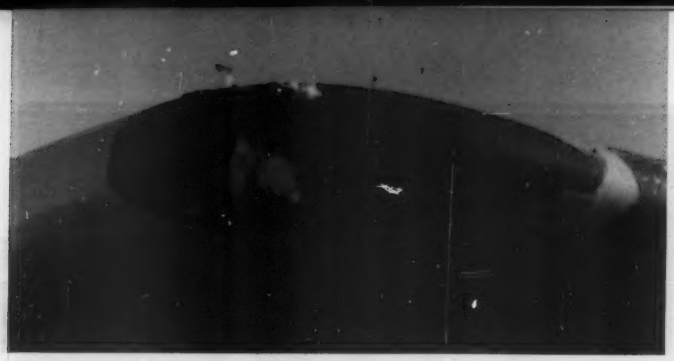
VP-67 has a P-3B, BuNo. 152763, that was built 22 years ago, in September 1967. During its long life, this aircraft has had the usual "minor" mishaps: one lightning strike and 21 birdstrikes. The noteworthy thing is that at least 11 of these birdstrikes occurred in less than one second on one flight.

The flight began at NAS Whidbey as a pilot airways training flight. By the time the P-3 arrived at its destination, NAS Memphis, it was dark and condition five had been set for the approach. The Orion was just west of the Mississippi River, at an altitude of 8,000 feet and 230 KIAS.

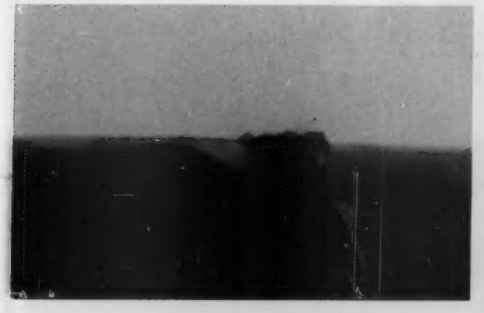
Suddenly, the crew heard a loud bang, and the port aft observer reported fire and sparks coming from the No.2 engine tailpipe. The flight deck crew scanned the engine instruments, but all indications were normal, and there were no unusual aircraft control problems.

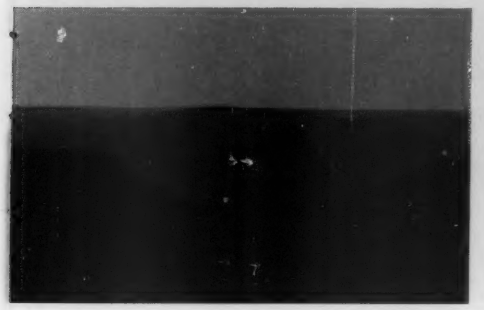
Ruling out turbine failure on No. 2 due to the normal instrument readings, the crew began to think they might have had a midair. They declared an emergency and continued with an uneventful landing to Memphis. As the pilot taxied clear of the runway, the starboard forward observer saw a sizeable hole in the leading edge of the right wing.

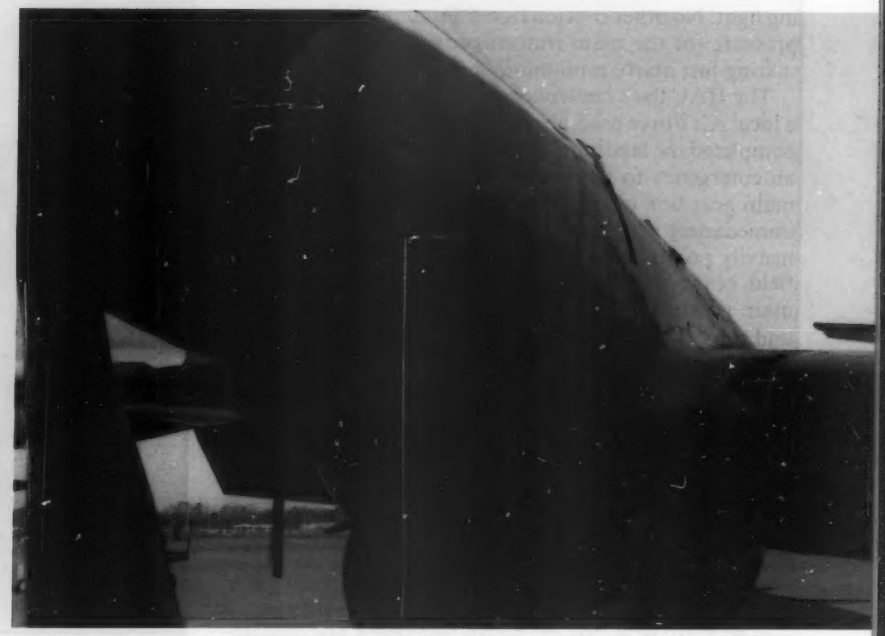
The pilot secured No. 1 and No. 2 engines, and the flight engineer exited the aircraft for a visual inspection. To



For the Winter







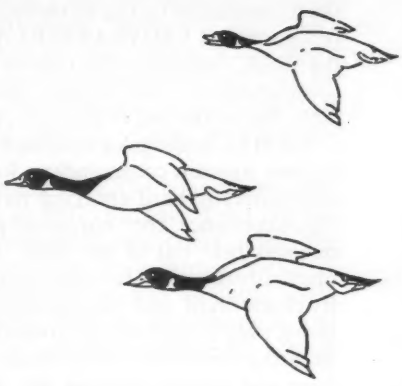
his surprise, he found multiple birdstrikes on the starboard wing's leading edge and engine nacelle wing fillets. The pilot secured the remaining engines and began a postflight inspection. They found cracks in No. 3 and No. 4 engine spinners, a soft spot in the nose radome, and the starboard ESM antenna pod was cracked. One of the many holes in the wing leading edge was as large as a bowling ball, and there was one very dead, but intact, bird inside.

The culprits were Canada geese flying south down the Mississippi flyway. Migrating geese are found along this route in the fall, flying between 2,000 feet and 8,000 feet.

Only large aircraft such as the P-3 or C-130 could sustain this much damage and land safely. What would have happened if the plane had been an F-14 or C-12?

This situation is unavoidable at night. The only sure way to prepare for a nighttime birdstrike is to know the areas of migrating birds, as well as areas of large concentrations around coastal air stations and your nearest divert. ◄

AMEC(AW) Wallace is a selected air reservist, and is a plankowner in VP-67. He served as a plane captain in SP-2Hs, and when the squadron transitioned to P-3s in 1977, he moved to the maintenance department. He is also the squadron's career counselor. In civilian life, he is a self-employed furniture designer.



Trial By Wire

by LCdr. John S[illegible] Lt. Kevin Brady

IT was a beautiful fall Monday, and the RH-53D was cruising along at 500 feet, heading home after a routine NATOPS check flight. The HAC and copilot were busily involved in the "What If" game when the copilot noticed a momentary flicker of the master caution warning light. No other caution lights illuminated, but the oil pressure for the main transmission gearbox was fluctuating just above minimum.

The HAC took control of the aircraft and headed for a local Air Force base, about six miles away. The copilot completed the landing checklist while the HAC declared an emergency to the tower. Fifteen seconds later, the main gear box oil pressure dropped to zero. The crew immediately set up for the only available field in the heavily populated area below: a small YMCA athletic field near a river, bounded by high-power lines. The main gearbox chip light illuminated 10 seconds later, and the helicopter landed immediately.

The crew waited for maintenance crews to arrive as they regaled the receptionist at the YMCA and passers-by with tales of their prowess. The crew was proud of themselves. They had attended a safety stand-down the previous Friday where they had been briefed on a similar incident involving another Sea Stallion where a delay in landing had cost 17 lives. The crew had learned and applied a valuable lesson, and had safely landed in a heavily populated area one rotor diameter from high-power lines, with no injuries or damage.

The main gear box oil pump had failed and disintegrated, shooting parts throughout the transmission. Several parts were later found on the chip detectors, and the transmission had to be replaced. The crew was later recognized as COMNAVAIRLANT's Safety Pros of the Week, complete with t-shirts and official letters of commendation. They began to believe they were invincible, but by the end of the week, that would all change.

The HAC and copilot were both former SERGRADS, current mission commanders, functional check pilots and generally hard-charging naval aviators. With all that experience, they requested permission to fly their downed helo out of the field. The athletic field was obviously too small for them to complete a controllability check flight, and then go back home. By early afternoon, they completed the ground turn, but the weather began to deteriorate. They could see the other side of the river and several hundred feet above the power lines they would have to cross. Visibility was about two miles, and the ceiling was 500 feet — not quite VFR. The pilots dutifully called the base and asked their CO's permission to deviate from OPNAV 3710's requirement for a VFR functional test flight. The skipper said no, and they shut down. They drove back to the squadron.

A half-hour after they returned, the maintenance officer ran into the CO's office. Hurricane force winds were forecast that night, and the helo could not be folded and secured. The CO, XO, Ops and maintenance were concerned about damage to the aircraft if it weren't flown back immediately.

"Can you get that aircraft out of there VFR?" the skipper asked the crew. Was he kidding? They were hackers. With a hearty "Yes, sir!" and stomachs full of butterflies, they headed back out. The maintenance officer told them official sunset was 1715.

Unfortunately, it was now 1530, and the off-base

LCdr. Ron Rygg

traffic was terrible. The tunnel was blocked, and the 45-minute trip back to the athletic field took an extra 30 minutes. The HAC arrived first and had the head on the line by the time the copilot arrived. They were airborne at 1650; sunset was really at 1652. We'll let the HAC and his copilot take it from here.

Copilot: It was painfully obvious almost immediately after takeoff that we were in serious trouble. We were at 100 feet, parallel to the power lines we had to cross to get home. All we could see were the lower portions of the wires hanging down beneath the overcast. The HAC suggested going IFR to get over the wires, i.e., climbing to 500 feet IMC and letting back down after a specified length of time. I disagreed rather strongly and suggested that we turn away from the wires, contact Approach, and climb into the overcast under positive control for an approach back home.

HAC: Once I realized that we could not make it home the way we had planned, I had two nagging thoughts. First, the CO distinctly said, "Bring the plane back VFR." Secondly, we had just had a gearbox failure last Monday. I would have to take this aircraft into IMC for an extended period to fly home and shoot an approach — this would take 20 minutes — with a brand new transmission.

After I suggested going IFR, the copilot disagreed and suggested getting an IFR clearance. I did not like that, either. Then, I suggested continuing across the river and landing in one of the many farmers' fields on the opposite bank. There was no way we could safely return to the athletic field. Darkness was closing in, and there didn't appear to be any other options. My copilot agreed.

Copilot: I dropped the gear and completed the landing

I have no idea what our altitude was, but I expected to hit the wires any minute. My life didn't flash before my eyes, but I distinctly remember thinking, "So, this is what it feels like right before you die."

checklist. Neither of us were on the gauges. We both had our eyes outside the cockpit looking for wires. It was dark now, and we were only two-thirds across the river, and down to 50 feet. The HAC said, "I think it's closing down," and made a 180-degree turn back to parallel the wires going the other way. Then, he again suggested going IFR just to get over the wires and back to VFR. I disagreed once more.

HAC: I was still at the controls, and it was getting darker every minute. I again suggested an IFR climb, but, once again, my copilot protested. I recalled a similar situation while I was back in the training command. I was at 300 feet AGL underneath a solid layer, unable to contact Approach, and the ceiling was coming down.

I accelerated the T-34 to max speed, pulled the nose up 30 degrees, and popped out of the clag at 1,500 feet. I decided to try it again. The helo accelerated nicely and at 50 feet and 120 knots, I rotated the nose to 20 degrees, and the aircraft climbed like a rocket. The next thing I knew, we were at 500 feet and zero airspeed. The aircraft wasn't responding, and I was yelling for help.

Copilot: When I took over the controls, all I saw was zero airspeed, 25-degrees nose down, 25-degrees left wing down and the ball pegged out to the left. I have no idea what our altitude was, but I expected to hit the wires any minute. My life didn't flash before my eyes, but I distinctly remember thinking, "So, *this* is what it feels like right before you die." I credit two things with our being alive today: all my basic instrument instructors and the grace of God.

I automatically centered the ball, leveled the wings and raised the nose while adding power. I saw the VSI dropping out of sight. The recovery was actually pretty violent as the servo lights were flashing while the hydraulic pumps cavitated. The crewman told me later that he was getting bounced against the cabin walls. Fortunately, we broke out about a half-mile past the wires where the HAC took control back for the rest of the flight.

We had an uneventful 10-minute trip back at 50 feet and 50 knots. We were both familiar with the area, and other than having to sidestep a freighter in the bay and a frigate at the pier while we were on a one-mile final, we were in pretty good shape. The tower cleared us for special VFR, but they never saw us until we were on the deck.

We taxied in, swore our crewman to secrecy and shut down. The operations duty officer told us the CO and XO were waiting for us at the club. He later told us that they had left just before our landing after spending the last hour running to the window every time they heard a helicopter. After telling the CO and XO that the flight was a piece of cake, we got our pats on the back. Of course, the hurricane winds never appeared, and the next day was CAVU.

There were many people who would have been tagged in the MIR on this one. The crew learned many lessons.

Stick to the plan. When a sense of urgency developed, they discarded their well-thought-out, well-rehearsed plan to go to the Air Force base to complete the test hop, as well as the plan not to launch at 500 and 2. All senior personnel should weigh the need to waive specific requirements and the way in which their wishes will be perceived by their subordinates. A good initial plan usually doesn't go bad. There were other options, including removing the blades, or tying the blades down and hoping for the best. The loss of six rotor blades was a smaller risk than the loss of three lives and the entire aircraft.

Rebrief the plan. Sure, they had briefed the flight, but they didn't *rebrief* when the situation changed so quickly. Weather problems and the sun setting were never discussed. Nor did they adequately use a checklist. They knew the weather was bad, but if they had asked for a weather update, the need for the flight would probably have been reevaluated. Marginal VMC at 100 feet is not the time to discuss what to do in IMC.

If it doesn't feel right, it's not. The copilot was approached by the QA officer, who said, "You shouldn't be flying this hop," just before they left. He was very uncomfortable as he drove out to the athletic field, but if everyone *else* was willing to do it . . . The red flags were there, but the copilot chose to ignore them.

Just say no. If just one person in this chain had stood up and said, "I don't think this is a good idea," the chain might have broken. No one wanted to admit that they weren't a team player. Weather-related incidents in peacetime are *never* justifiable.

Nobody's invincible. The fact that both pilots were experienced HACS, even flight instructors, and had just made a good decision earlier in the week, was no guarantee that they would continue making good decisions. In the air, mishaps and death respect neither rank nor experience. ◄

LCdr. Selden was the QA officer for HM-12. He is presently assigned to the Naval War College. He was a SERGRAD instructor and also served in HM-16.

Lt. Brady is the NATOPS officer for HM-12. He also served a SERGRAD tour, and was also in HM-16.

Lessons Relearned

By Lt. Dan Crisp

IT was one of those days JOs live for: a section low-level, air-to-ground strafing mission from NAS Southwest, with *no adult supervision*. Rolling out of the line, I felt pretty good about myself. After all, I had been out of the RAG for three months, felt comfortable in the F-14, and believed I was developing a good reputation. I was crewed with a seasoned pilot who had flown this low-level many times. What could go wrong?

Being in a non-TARPS squadron can have its disadvantages with respect to low-level proficiency and planning, but Brand-X was just down the hall. After a quick run-down on their mission planning procedures, I had all the INS data I needed to get us around the course and back. Who needed two charts in the cockpit, anyway? We knew the route, and between the INS and the one chart, there was no problem.

Before I knew it, we were airborne and headed toward the entry point for the VR route. All I had to do was input the turn points and enjoy the flight. Unfortunately, as new guys are prone to do, I was soon fighting snakes while trying to make descent checks and coordinate our entry onto the route. Somehow, I managed to get everything straight and quickly punched in the last few data points as we descended into the low altitude area.

The weather was CAVU in the desert, with at least 30 nm visibility. As we proceeded along the route, I felt that warm comfortable feeling return and settled back to enjoy the much-needed change of scenery while I experimented with the TARPS navigation mode of the Weapons Control System (WCS).

As we approached the final leg, it dawned on me that I had forgotten to input the target data for the strafing portion of the hop. As I went into the cockpit and fumbled for my kneeboard card, the ICS suddenly crackled.

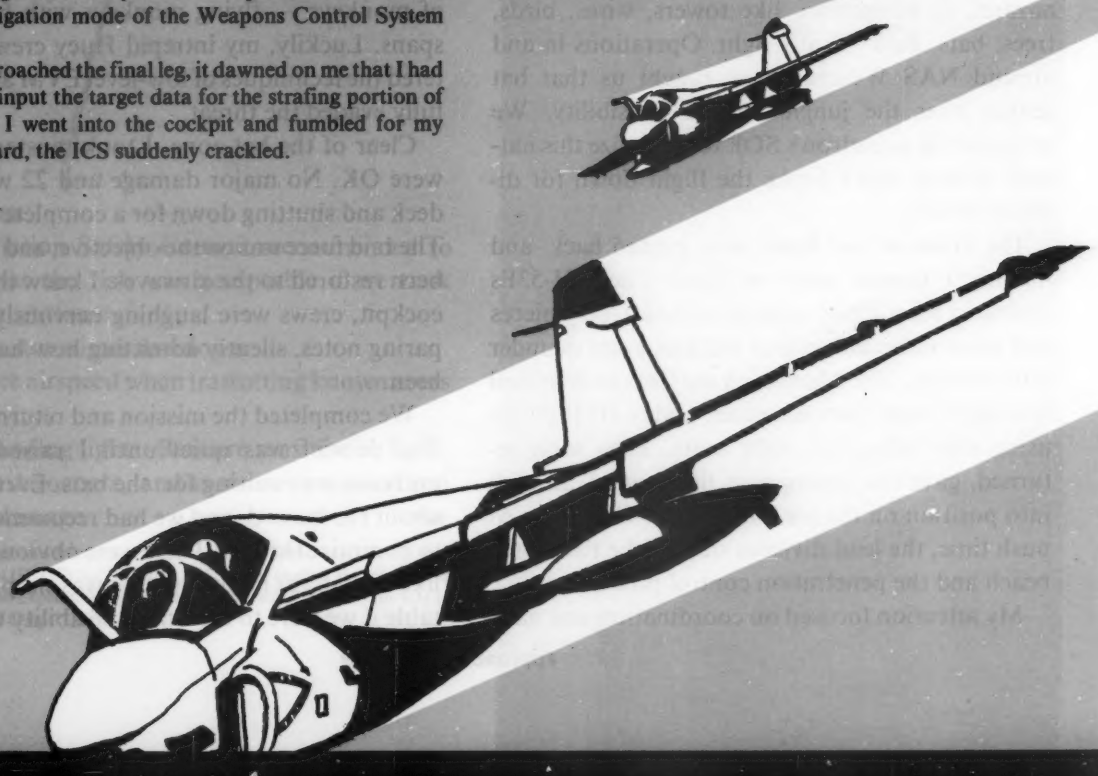
"Heads up. Traffic right, 2 o'clock, climb." Feeling the onset of G, I looked up to see two A-6s pass 500 feet below us at less than a quarter of a mile. The word "MARINES" prominently displayed on the side of those Intruders remains the best impression I have of that moment.

A near midair? Perhaps, if my pilot had not kept a sharp lookout. But, fortunately, all I have to show for this experience is an increased awareness of my airborne responsibilities and a rather undramatic sea story. I relearned several lessons.

Task management by both crew members is important, even when you're flying with an experienced pilot or NFO. I was experimenting with the WCS when I should have been looking outside. The Big Sky theory almost failed me that day. I would never have seen those A-6s, except for the pilot's ICS call; I don't know if the Marines saw *us*. Also, both crew members should have had their own chart.

I used to take a quick look at a FLIP low altitude navigation chart to determine Military Training Route conflicts, but needless to say, this method was not complete. Yes, it's a pain to check the FLIP AP-1B list and flip back and forth between the appropriate VF and IR routes, but it sure does a lot for my peace of mind.

Lt. Crisp is a RIO with VF-51, and is the squadron's Weapons Training Officer.



Batstrike!

By Maj. Roy A. Arnold, USMC

THE mission was to fly in support of two assaults: an artillery raid against a SAM site, and a heliborne raid against a barracks and armory complex. I was assigned as mission commander and Helicopter Coordinator (Airborne). We met with all the units involved and soon had a plan that met the requirements of the Ground Combat Element (GCE) Commander, which offered the greatest chance for survival.

We had a brief at 1800, then went to bed. Intelligence and metro information would be given at 0200. The EMCON/Ziplip launch would go at 0400. I hit the rack believing we had done everything possible to ensure a successful mission.

The next morning, I briefed safety. I found the standard phrases rolling off my tongue from habit. I reviewed some of the hazards we could expect on this mission: night launch EPs, NVG failures, inadvertent IMC and, last but not least, low-level hazards to navigation, like towers, wires, birds, trees, bats. Bats? That's right. Operations in and around NAS Westpac have taught us that bat strikes over the jungle were a possibility. We reviewed the squadron's SOP to minimize this natural hazard, and I broke the flight down for division briefs.

The doors of our Huey were pinned back, and the night launch went on time. The CH-53Es moved in for a Ziplip pickup of the artillery pieces and were outbound to their holding point in under four minutes. The Marines in the Cobras detached to make a route reconnaissance and to ID the zone using their telescopic sight units. They soon returned, gave the appropriate light signal, and fell into position on the lead division of CH-46Es. At push time, the lead division started the run to the beach and the penetration control point.

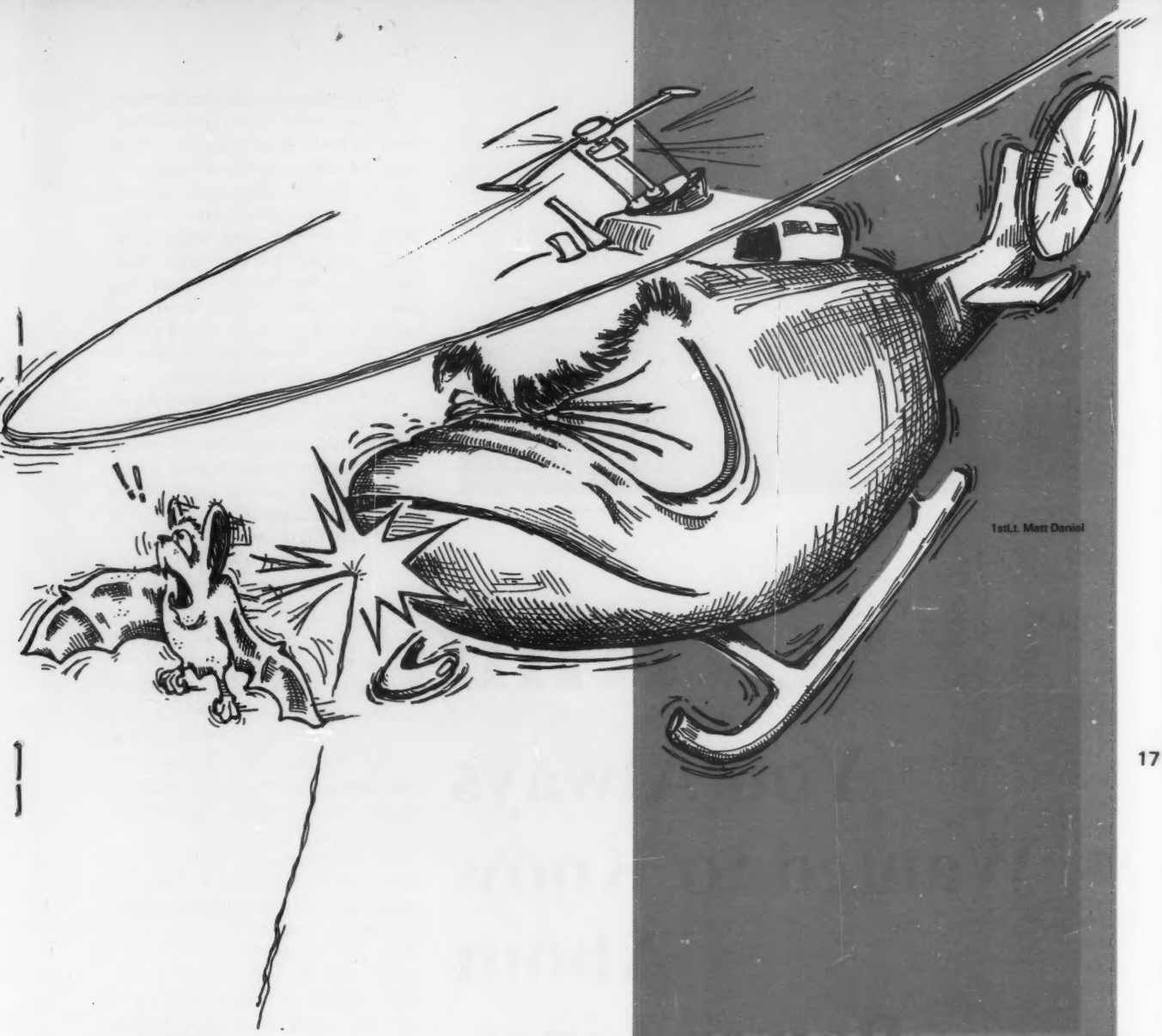
My attention focused on coordination and navigation of the two missions. The route would take the flight into the mountains and down into the zone at treetop level. We made our checkpoints on time, and no matter how hard I tried, I couldn't find anything that needed my attention as the airborne coordinator. Detailed mission planning does pay off. We passed the IP, and the lead division set up their approach with the trail divisions taking interval to phase entry into the zone. Our goal was all troops in the zone in two minutes.

The first division landed exactly at 0515, L-hour. My Huey was maneuvering to remain masked from the LZ but in position to observe the IP, when radio silence was broken and things started to get interesting.

"Two-two's hit, diverting to the airfield. . ." In the second that call took to register, the airwaves were filled with more calls. "Four-three's taking multiple hits . . . I'm putting it in the zone. . ." "Five-one's going down behind Four-three. . ." It all happened so fast that it was over as I reached for the mike to make a call for damage reports and to check that 22 had made it safe on deck. The ICS suddenly got busy. It was our turn to experience Westpac's answer to the Wizard of Oz: bats the size of monkeys — flying monkeys with 6-foot wing spans. Luckily, my intrepid Huey crew had mastered the techniques of low-level EVM and successfully evaded the threat.

Clear of the bat zone, I took muster. All birds were OK. No major damage and 22 was safe on deck and shutting down for a complete once-over. The raid force was on the objective, and silence had been restored to the airwaves. I knew that in every cockpit, crews were laughing nervously and comparing notes, silently admitting how lucky we had been.

We completed the mission and returned to base. The debrief was quiet until I raised the issue everyone was waiting for: the bats. Everyone knew about the hazard, and we had recommended ways to minimize the risk. There were obvious solutions, like don't fly at night. But that was simply unacceptable if we were to maintain the ability to complete



1stLt. Matt Daniel

our mission.

The Aviation Safety Council recommended to the CO that the risk was acceptable if we took certain precautions:

1. Make sure visors are down.
2. Reduce airspeed when transitting known areas of bat activity.
3. Use landing lights. Bats are sensitive to light.
4. If a strike occurs, land as soon as practical and check for damage.

At the time of this incident, Maj. Arnold was Director of Safety and Standardization (DOSS) for HMM(C)-164, the air combat element for the Eleventh Marine Expeditionary Unit. He is currently the DOSS for HMT-303, the Marine Corps' UH-1N/AH-1 FRS.

Everything You Always Wanted to Know About Power Lines, But Were Afraid to Look For

By Cdr. Gary B. Hudspeth

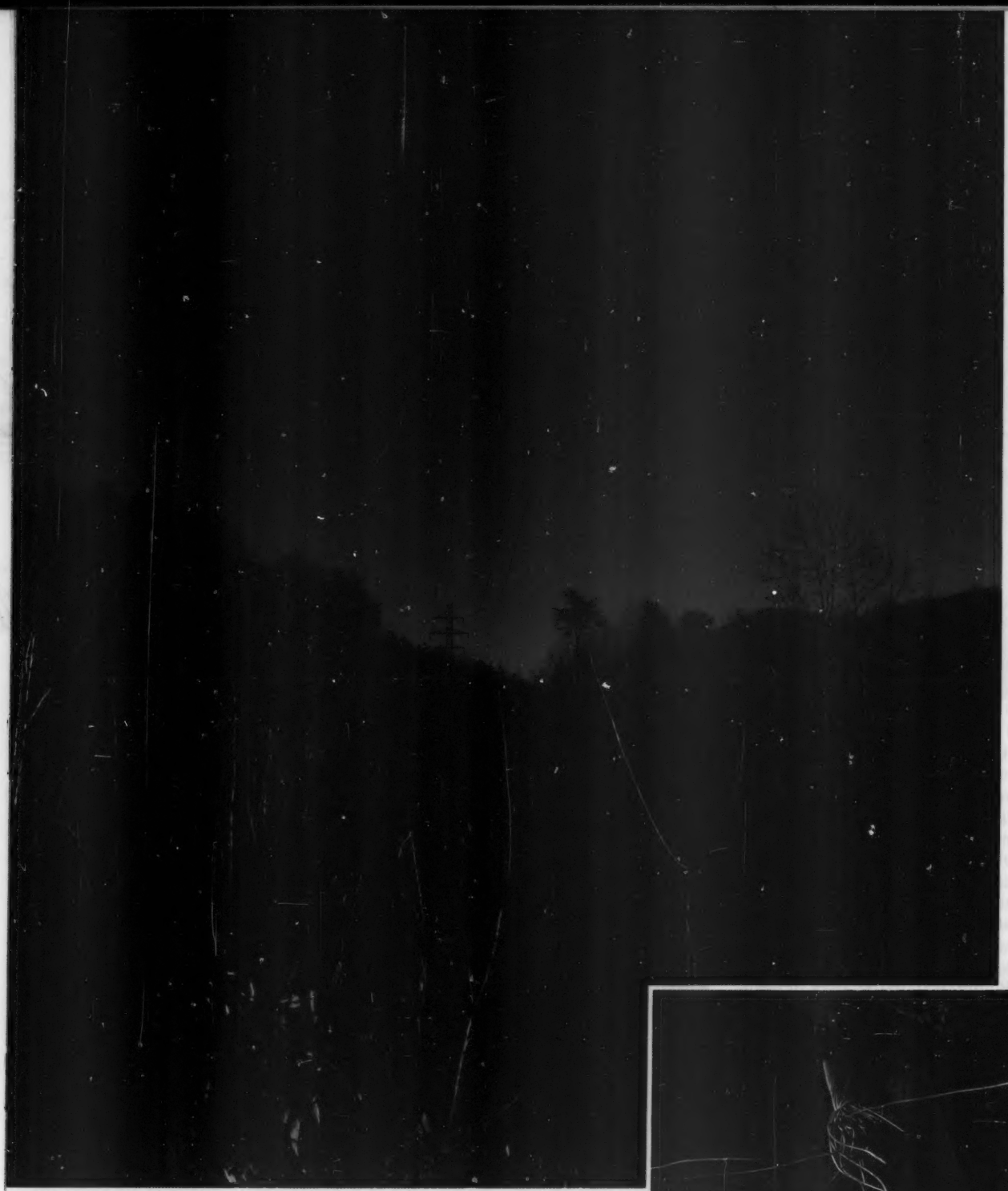
POWER lines predate the airplane. You may think the Wright brothers went to Kitty Hawk because of the steady winds, suitable for flight testing. In reality, they went because there were no power lines on the beach in 1903. If you believe that, you'll also believe they wore business suits while flying — which they did! For some strange reason, we seem to seek out power lines during our flights. The damage to aircraft and careers can be staggering.

With the rural electrification program of the 1930s, and the subsequent proliferation of electrical appliances after World War II, virgin flying terrain became criss-crossed with power lines of progress. Obstacle-free flight became as scarce as the open range after the invention of barbed wire. As a result, the cowboy did not become extinct; he just changed horses. Today's aviator — read cowboy — must abide by the same rule as the first fliers: see and avoid. Here are several cases where aircraft ran into power lines.

An F-14 crew, on an authorized VR route and without a radar altimeter, flew their aircraft into a static grounding line at 174 feet AGL. They did not see the line until they were right on top of it, and they didn't realize they'd hit the wire until they saw wing damage during the flight home. A Class C mishap.

An A-6 crew flew an authorized IR route, VMC. Although they were within route altitude restrictions, they still hit a static grounding line at 290 feet AGL. This crew did not see the line until just prior to impact. They tried to pull up, but it was too late. They declared an emergency and diverted with one-third of the Intruder's radome gone. A Class C mishap.

Another A-6 crew, on an authorized low-level in a foreign country, made a practice attack, within altitude restrictions, on one of the turn-



The Intruder that struck this power line suffered a Class C mishap. The wire damage in photo at right shows one result of the A-6 strike.

points. On the pullout from a 10- to 15-degree dive, the A-6 hit a static grounding line between 500 to 1,000 feet AGL. The wingman saw the lead aircraft pull up sharply, saw the wires, decided he could not clear them and nosed his aircraft over. He passed *below* some wires, and *above* others. The lead sustained Class B damage.

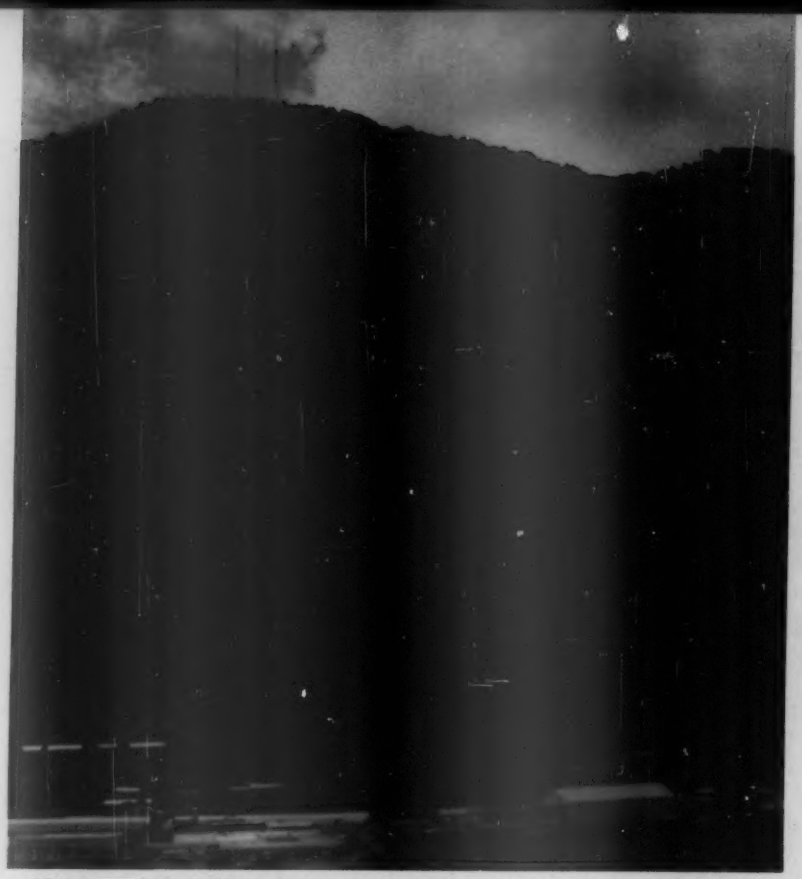
Another A-6 crew, on an authorized VR route, but below authorized altitude, hit two static grounding lines at 360 feet AGL. The crew started to pull up, but to no avail. A Class C mishap.

You may think that midairs with cables are survivable. But in each of the previous cases, the aircraft hit the smaller wires, the 7/16-inch-diameter aluminum conductor steel-reinforced static or grounding wires. These wires, suspended from the tops of support towers, can be as little as 15 feet above the more visible, heavier power lines, or as much as 190 feet above them.

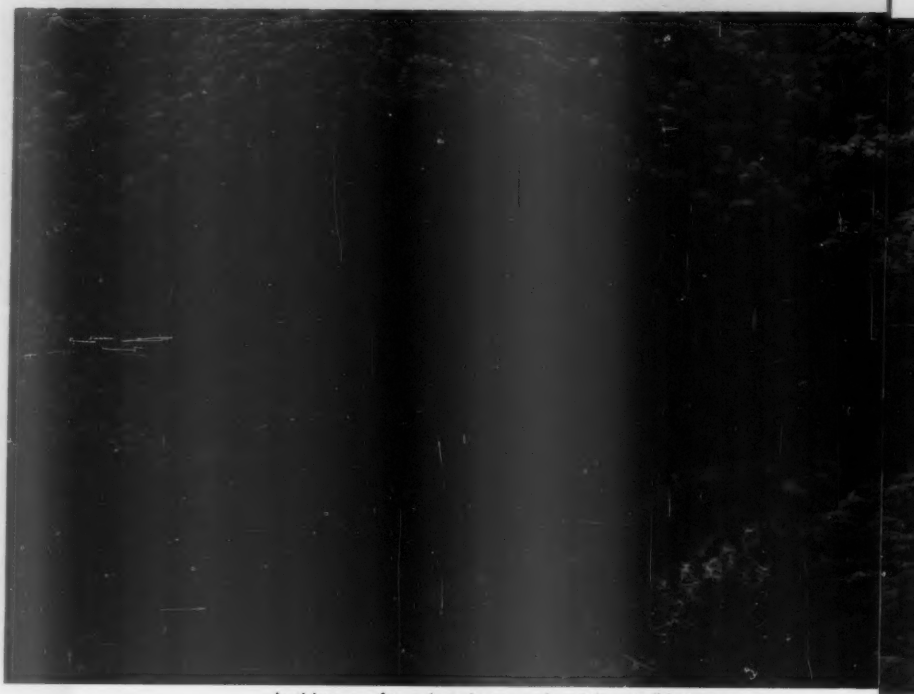
The static grounding lines are designed to protect the power lines from lightning strikes, and have an advertised tensile strength of 19,060 pounds each. The heavier power lines are 1¼- or 2½-inch diameter cables, depending on the span between the towers. Hitting one or more of *those* wires at the speed of heat could nicely slice, dice and otherwise puree your aircraft as well as any Ronco Vegomatic.

Before wandering over terrain, aircrews consult a variety of resources. All of us use TPC and JOG charts, but do we really understand what we see? Reading the legend (the edge of the chart that gets cut off first), we find one of many cautions about vertical obstructions, including power lines. We also see that power lines below 200 feet AGL won't appear on your chart.

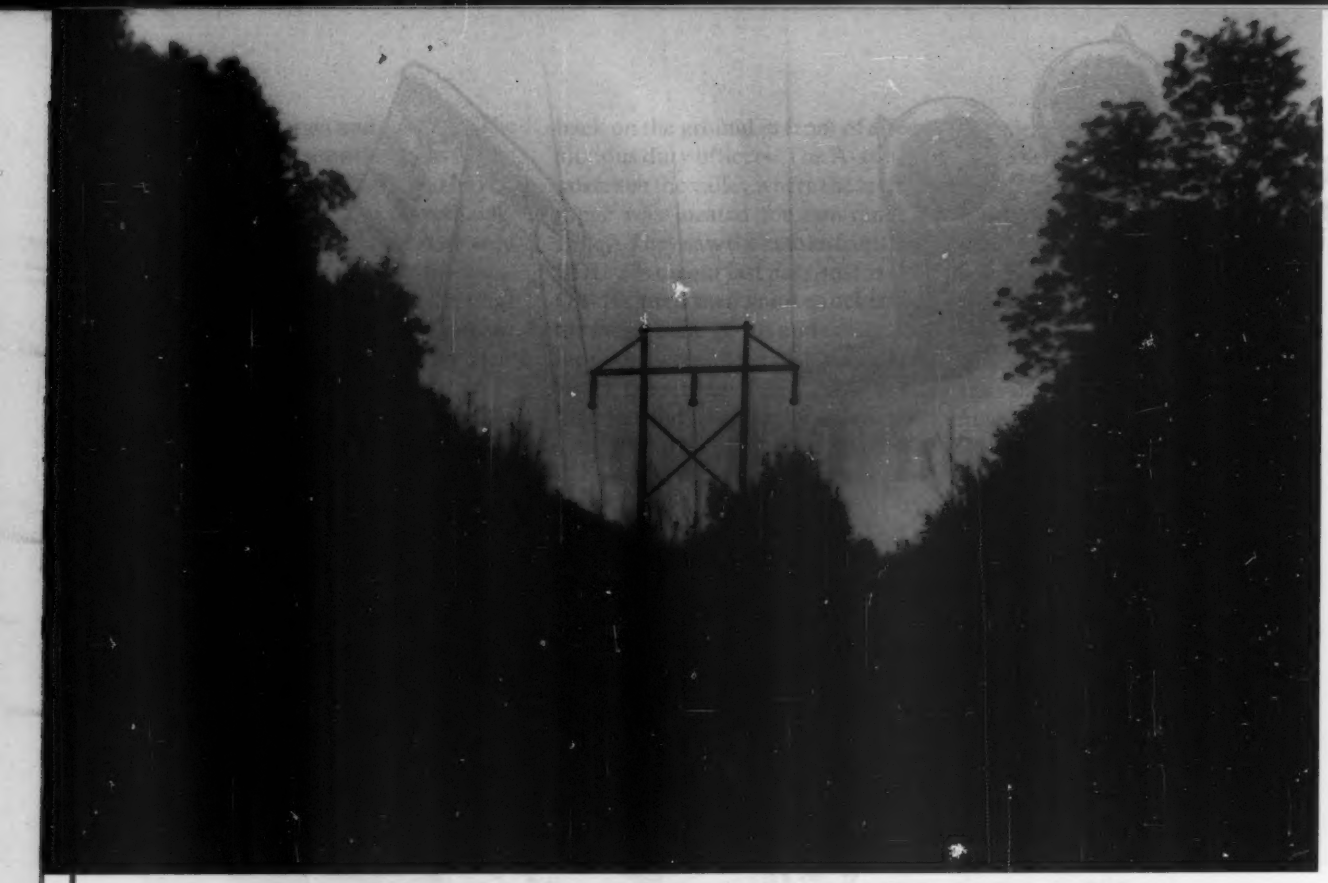
Contour lines are not always accurate. Terrain and obstruction data may not be where you think it is, and



A Navy patrol aircraft did not see this wire strung across a bay in Pago Pago when the pilot elected to do an impromptu fly-by. The plane hit the wire and crashed near a local hotel.



In this type of terrain, wires are almost impossible to see.



small chart errors become more critical in terrain-following flight.

An important supplement to all aviation charts is the CHUM (Chart Update Manual), which lists recent additions and deletions in the ever-changing world of obstructions. One final consideration for low-level flight can be found in FLIP AP/1B at the beginning of Chapters 1 and 2, IR and VR Military Training Routes. In bold print, the caution reads:

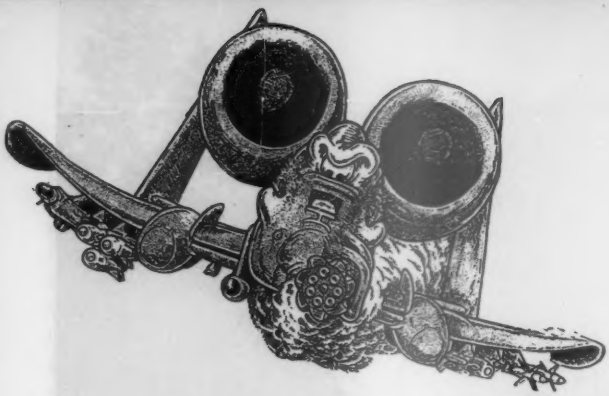
Pilots flying an MTR in visual meteorological conditions (VMC) are responsible for maintaining obstacle clearance and compliance with OPNAVINST 3710.7 regardless of the route's published altitude(s).

"So, tell me something new," you say. You already know power lines are hard to see and that they pop up when you don't expect them. You also know charts just aren't as up to date as you'd like them to be. And it's no secret that after hitting a wire, the second most feared incident is the resulting FNAEB.

Those routes we fly over and over again for training are familiar. The routes we fly once in a while are not surprising except when we get off centerline. But the never-flown, away-from-home-base, *surface*-to-1,500-feet-AGL route should be your most dangerous obstacle flight. Your head should be on a swivel. In fact, in the previous four stories, all the pilots had seen their route before — albeit several months to a year — and the crews *had* studied their charts.

To keep aircraft from hitting power lines, we should demand more accurate and position information on charts and in MTR remarks. There are procedures for checking routes and submitting new, corrected information. Train like you fight; there won't be much gouge on power lines over enemy territory. ◄

Cdr. Hudspeth is an A-6 pilot, and is the Safety Officer for COMTACWINGSLANT.



Can You Tell an A-Hog From an OA-Hog?

©Hank Caruso

By Maj. Gregg Straight, USAF

Thanks to Maj. Don Rightmyer, USAF, editor of Tac Attack, for this story.

MY wingman and I had just finished a 45-degree dive-bomb pattern. We did a dry spacing pass to lose altitude and check surface winds before making a low-angle strafing pass with our 30mm GAU-8 Gatling guns. As I was looking down to see how the strafe rags were hanging, my wingman called that there were other aircraft on our range. I looked back at my 7 o'clock and saw a Marine A-4 pass between me and my wingman, slightly beneath our altitude and perpendicular to the range run-in heading. As we started a climb and made our knock-it-off calls, I looked back at the target circle we had just finished bombing and saw two strings of six BDU-33s near the target. We held high and dry for 10 minutes until we were sure the Marines wouldn't be back. The A-4s had made no radio calls on our range frequency, and had disappeared as quickly as they had come.

Meanwhile, on a tactics range about 10 miles southwest of our controlled range, a flight of two OA-10As was talking to a flight of two Marine A-4s. The A-4s had been cleared from the IP to the target, but the OA-10 FAC did not have them in sight. The FAC then fired a white phosphorus rocket to mark the target to help the A-4s locate it. About this time, the A-4 wingman spotted the smoke on the ground, saw two A-10s, and called the target in sight. The FAC told them to continue, but he still didn't have them in sight.

The A-4s transitioned from a dive-bomb event to a low-angle release, and with No. 2 in the lead, they

bombed the target and egressed. The FAC suspected something was wrong when the A-4s called "in" and he still didn't see them. He immediately called for an abort. The A-4s told him they'd already expended — without clearance — and were on their way home. The FACs could not see any smokes on the ground on their tactics range.

The story was pieced together back on the ground in front of a few anxious duty officers. The A-4s had mistaken the valley where the tactics range was located for our range's valley. They saw the smoke from the BDU-33s on our last pass, just as the OA-10s fired their smoke rockets in the target area. A-10s and smoke on the target were all the A-4s needed to attack the wrong target.

In the end, the Marine pilots got their lesson on navigation and dropping ordnance without clearance to expend. The OA-10 FACs learned some valuable lessons on positive control of fighters. I learned that an unscheduled flight can enter your range's restricted airspace without warning. Briefing a knock-it-off call for an unscheduled flight that enters the range now holds a special meaning for me. Heads up, everyone! ◄

Maj. Straight is assigned to the 355 TTW/DOTL.

Did I Really Do That?

By Lt. Kirk A. Rutland

IT was just your average night bombing hop during work-ups. I was starting my training for section leader, and this flight would be a piece of cake. Let's see, though, when was the last time I bombed at night? Six weeks ago. OK, that just meant a more intense instrument scan, right. Sure hope I get a full alignment so that it's not a manual bombing hop. On deck, good start, good SINS, good alignment, sierra hotel! Ready to go.

Rendezvous and push out. Remember, clear the area with Radar. Looks OK. Stand by, release, two good smokes in the water. Here we go. Lead's breaking. Pattern looks good, weapons selected for a bomb on that all-important first run, radar altimeter set. Let's see, I briefed SOP rules: radar altimeter 10 percent below release altitude. It's automatic now. Lead's rolling in. Good computer symbology. Boy, this A-7 weapon system is awesome! Just place the "Death Diamond" and let the computer do the rest.

Down the chute. Good release. Now pull to the horizon. Get that nose up before you look. Ten nose-up on the HUD, and coming up. Now roll to spot that hit. Wait a second, the radar altimeter warning is going off. That's OK. It always does that. Check again on the HUD. Nose is still above the horizon. The warning should stop soon. Here's the flash, back to scan that HUD. Wait, the warning is still sounding. What's happening? Cross-checking the ADI shows me nose down.

Pull! My scan is now fixed on the radar altimeter/angle of attack. I bottom out at 400 feet. That gauge is burned forever in my brain. Four hundred feet from being a fiery flash in the ocean.

What happened? Clearly, I set myself up for this heart-stopper. My A-7E's inertial system decided it couldn't hack the pullout and produced a pitch error on my HUD. Since it had been a while since my last night bombing hop, I accept the fact that my scan broke down. I did, however, get a good release at my planned altitude without my scan falling apart to that point.

Maybe I hadn't set my radar altimeter correctly. I had grown used to hearing it go off occasionally during the pullout. How long it stays on depends on how hard you pull, and how far you pull your nose up during recovery. I only know that somewhere in the back of my head a voice was screaming that the tone had been on too long, even though I *knew* I had started a proper recovery.

With the perfect 20-20 hindsight that comes from a sleepless night, I have decided that I simply didn't know my own limits for that flight. Why did I try to spot my hit on the first run? I don't know. I guess I assumed I could hack it. I thought my nose was above the horizon, but how can you tell when there's no horizon? The bottom line: Know your limitations and live by them.

Lt. Rutland, an A-7E pilot, flew with VA-46, NAS Cecil Field, Fla. He recently was assigned to the Naval Weapons Center, China Lake, Calif.

Left to right: AW1 Miles J. Edgar, Lt. Vincente E. Danet, Cdr. Thomas J. Lee, Lt. Timothy W. Summers

Cdr. Thomas J. Lee
Lt. Vincente E. Danet
Lt. Timothy W. Summers
AW1 Miles J. Edgar
VS-22

After an overwater mission, the crew of VIDAR 705 were in the overhead marshal stack waiting for a Case I CV recovery. Cdr. Lee (pilot) descended out of the stack, scanning the pattern for his interval. As the S-3A passed through 3,000 feet, it was struck by a bird that shattered the pilot's windscreen, severely limiting Cdr. Lee's forward visibility.

He brought the Viking back to level flight and began slowing down. Lt. Summers (TACCO) and AW1 Edgar (SENSO) quickly performed the immediate action items for a cracked windshield. Lt. Danet (COTAC) informed the Air Officer of the birdstrike. After talking with a squadron representative and the air wing LSO, the crew decided to recover aboard the carrier.

Flying overhead the carrier at 200 KIAS, Cdr. Lee found his interval and made an easy left bank to enter downwind. On the first approach, the sun angle caused a blinding reflection off the broken windscreen, and the fresnel lens and landing area were completely obscured. During the second approach, the LSO helped with timely lineup and glideslope information, with backup calls from Lt. Danet. Cdr. Lee made an OK 3-wire recovery.

Postflight inspection revealed the remains of a medium-sized bird on the upper left portion of the pilot's windscreen, on the port side of the fuselage and on the port inboard leading edge flap. The windscreen was replaced, and the S-3 returned to service.

BRAVO ZULU

LCdr. Brad Goetsch
Ltjg. Scott Hines
VF-41

Thirty minutes after launching for a night AIC mission from USS *Theodore Roosevelt* (CVN-71), the F-14's port engine's rpm began to decay, followed by a flameout. LCdr. Goetsch (pilot) told the flight lead, who replied that there was fuel streaming from the left engine nacelle of LCdr. Goetsch's aircraft. LCdr. Goetsch immediately pulled the fuel shutoff handle, secured the left throttle and turned back toward the ship.

While these procedures appeared to stop the fuel leak, the aircrew saw severe pressure fluctuations from the left engine's combined hydraulic system. LCdr. Goetsch secured the bi-directional hydraulic pump to prevent further damage.

The crew now faced the difficult decision of whether to try to make a night, single-engine, zero-combined-hydraulic-pressure recovery, or a long 450 nm night single-engine overwater bingo with possible additional hydraulic problems. They decided to recover aboard ship, and reviewed four emergency procedures: single-engine approach, combined hydraulic failure, possible fuel migration and single-engine dirty bingo.

Ably supported by Ltjg. Hines (RIO), who was on his first at-sea period, LCdr. Goetsch recovered aboard the *Roosevelt* with an OK-underlined pass.

Left to right: Ltjg. Scott Hines, LCdr. Brad Goetsch

Left to right: Ens. Brad T. Swanson, Lt. Robert P. Tedesco

Lt. Robert P. Tedesco
Ens. Brad T. Swanson
VT-6

During a lead change on a formation training flight, Lt. Tedesco noticed a high closure rate on the lead aircraft as his student, Ens. Swanson, tried to maneuver into the wing position. Lt. Tedesco took control and tried to reduce power to slow the closure rate, but he saw that he could not reduce torque below the cruise power setting.

Lt. Tedesco told the lead aircraft of the problem, and he began a climbing turn toward NAS Whiting Field. Lt. Tedesco and Ens. Swanson prepared for a precautionary emergency landing as they evaluated their engine's condition, reviewed NATOPS, and discussed how to make the landing and secure the engine.

At 8,500 feet MSL, they completed the landing checklist and began a descent toward the runway. The crew secured the engine in the emergency landing pattern and made a deadstick landing.

Postflight inspection revealed a defective fuel control rod.

Capt. Michael J. Purvis, USMC
Lt. Larry L. Bezold
MAWTS-1
Capt. John F. O'Leary, USMC
VMAQ-2

While performing the guns-defense portion of a basic air maneuvering (BAM) flight near MCAS Yuma, Capt. Purvis (pilot and WTI instructor) experienced a control malfunction. As he tried to recover from a 45-degree left-wing-down, 10-degree nose-down attitude at approximately 10,000 feet, he discovered that his EA-6B would not respond to right stick input.

Using rudder and back stick, Capt. Purvis was able to return the Prowler to straight and level flight. Capt. O'Leary (ECMO-1 and WTI student) tried to trouble-shoot the problem using his NATOPS pocket checklist. He requested a visual inspection from the pilot of another A-6. The inspection revealed that the right flaperon did not work. Lt. Bezold (ECMO-2 and WTI instructor) contacted ATC to declare an emergency and to coordinate approach procedures while Capt. Purvis and Capt. O'Leary performed a slow flight-control check.

With no right flaperon available, Capt. Purvis set up for a long straight-in and brought the Prowler down for a centerline approach and arrestment.

Investigation revealed that the right flaperon feedback pushrod had become disconnected from the flaperon actuator; the nut, washer and cotter key were missing.

Left to right: Lt. Larry L. Bezold, Capt. Michael J. Purvis, USMC, Capt. John F. O'Leary, USMC

Strike Bird

By LCdr. Lenny Fox

"ONE's in. One's off."
"Your hit 30 feet at nine."
"Two's in. Two's off."
"Bull."
"Three's in. Three's off."
"Twenty-five at six."
"One's in. One's off."
"Seventeen at one."
"Two's in. Two's aborting. I've got a bird."
"Two from lead, did he go down the engine?"

"No, he went behind the rudder pedal."

"Understand behind the rudder pedal?" (That must be one gaping hole in the radome.)

"That's affirm. I think it's a sparrow."

"How can you tell?" (Being cool in the face of adversity is one thing, but being able to inspect blood and guts in the cockpit and determine species sounds like a crock.)

"He's still there. No. Wait. He's coming out."

"Better slow down." (The wind must be whipping through there.)

"He just flew past my face."

"Check your visor down and your mask on." (This could get ugly.)

"I'm going negative G to see if I can dislodge him."

"I wouldn't do that! Let me join to take a look at that hole."

"What hole?"

"The hole the bird made."

"He didn't make a hole."

"Then how did he get there?"

"He must have taken off with me."

The fact was he did — and he was still alive The stowaway was a fledgling sparrow about two days out of the nest. The bulk of his flying experience had been accumulated behind the left rudder pedal of an F/A-18. So safe a refuge did this spot seem to him that once on deck it took 20 hours of coaxing to rid the Hornet of its feathered companion. A team of men tried various schemes to extricate the bird. They virtually disassembled the cockpit. The sparrow squeezed his hollow bones into an inaccessible nook. They closed the canopy under the hot sun to bake the bird out. He was neither roasted not rousted. They chased an alley cat to sic on the cockpit squatter, but the cat was not amenable to the plan and skillfully avoided capture.

When hopes of retrieving the bird, or what was left of him, were all but gone, the canopy was opened, and a frazzled ball of feathers jumped out. The angle of descent to the ground differed only slightly from that of a rock. Before the bird could blink, it was surrounded, and in hand. In a gesture that made Francis of Assisi's love for creatures seem like animal abuse, the bird was made an honorary strike fighter pilot, escorted to an environment more suited to his kind and set free.

Mr. Guinness, if you're reading, I believe we have some records for the books:

Highest Flying Sparrow	30,000 feet
Fastest Winged Creature	620 knots
Most G-Tolerant Two-Chambered Heart	3
Most Heat-Resistant Aviator	147 deg
Best CEP by a Bird	Bull

LCdr. Fox flies F/A-18s with VFA-195. He is the squadron maintenance officer.

Parsons and Pettibone: A Great Team

The entire staff of "Approach" would like to salute LCdr. Dave Parsons for receiving the Grandpaw Pettibone Award for this year. This award is given annually to the individual or unit that contributed the most towards aviation safety through creative use of the media. Dave's tireless pursuit of innovation and high-quality material kept "Approach" in the limelight during the past three years. His efforts also contributed to the lowest mishap rate ever in Naval Aviation. Kudos, Hey Joe and fly 'em safe!

Dave before Approach in his earlier days as an affluent lieutenant.

Why 125 Feet?

By Capt. Timothy L. Burgess, USMC

IN the CH-46E community, we have a passion for setting the bugs on our radar altimeters at 125 feet during shore operations. At sea the setting varies from a low of 5 feet below deck edge (we're not Doppler-equipped) to a high of (you guessed it) 125 feet.

As a nugget, after checking NATOPS to make sure I wasn't asking another stupid question, I asked, "Why 125 feet?" My instructor's voice indicated that I had indeed asked another stupid question (in spite of the answer's absence from NATOPS). He responded, "Because that's our flare altitude for a 70-knot autorotation, lieu-ten-ant!"

I remember thinking that, if both engines flamed out, my interest would be more than casual, and that I probably would not be waiting around for the low light to illuminate. The helo doesn't have an aural warning, just a light. I was certain I'd have more exciting things to look at and think about. Then I set my radalt to 125 feet to match the instructor's.

The low light's real job in the airplane is to warn the pilot that the aircraft is closer to the ground than he wants it to be. This is important at night, especially while straight and level, and particularly over water, which always makes the night darker.

In the daytime we can see the ground. When we're landing or taking off, we know we're close to the ground. That's not to say that the takeoff and landing phases are not dangerous — they are. One moment of inattention, and you may end up wet, but the low light probably won't help down there. Where it does help is in that 300-foot Charlie pattern (with the extended upwind), or on that 500-foot or 1,000-foot ship-to-ship hop.

. . . The frightening truth is that several pilots have died during the past few years by flying their aircraft into the water or terrain . . .

But why 125 feet? Why not 50 feet below your straight and level pattern? Is there a naval aviator out there who would accept a 375-foot altitude deviation at night over water? A bit sloppy for even the weakest of us!

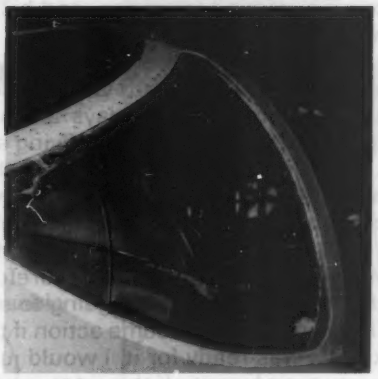
But put that bug at 450 feet, and the light comes on just about the time your copilot (if he's really backing you up on the instruments) says you've got a descent rate going. So let's say you've picked up a 150-foot descent rate, gradual but insidious. With the bug set at 450 feet, you have three minutes to detect the light, evaluate the situation, make a decision, add power and wait for the sink rate to become a climb. You math whizzes have already noticed that even with 125 feet set on the radalt, you'd still have almost a full minute before impact — plenty of time, right? I wish. Before attending aviation safety school, I would have agreed.

The frightening truth is that several pilots have died during the past few years by flying their aircraft into the water or terrain. They were good pilots, both military and commercial, who had sufficient training, adequate flight time and the respect of their fellow pilots. More often than not, radalts were set rather low — 125 feet or less. Would a higher setting have made a difference? I'll set mine higher from now on. That extra time I get by setting the bug higher, the time the light is on, doesn't cost me any more; yet, it could save me plenty. ◄

Capt. Burgess is aviation safety officer at MCAS Beaufort, S.C., flying SAR duty in the HH-46A and also flying the station's UC-12B.

Intruder vs. Ducks, 1 v 3

By Lt. Curt Lindsay



IT was another sunny day at NAS Northwest. Our nav/bombing mission included six system attacks, with low-level navigation to a radar bomb-scoring system (RBS), and high altitude return to base. We briefed the hop and took off in our 4.0 jet.

The flight to the target went fine, and after we put our bombs on target, we departed the range for our low-level. I called the local flight service station as we accelerated to 420 knots, and began a right descending turn to enter the low-level. I cleared the right side of our aircraft and looked back inside to check my chart. Suddenly, there was a loud pop, followed by a blast of cold air.

I looked at my pilot. He was covered with blood. His windscreen was spider-webbed and milk-white. The Attitude Display Indicator (Heads-Down Display) looked like a television with bad reception. It seemed as if we were in a windstorm. He yelled, "I'm OK!" into the ICS, but I could hardly understand him with the wind noise. Communication was obviously going to be a problem.

We started a climbing left turn toward Smalltown Field, a civilian airport about 70 miles away. Squawking emergency, we continued our climb to get a TACAN lock on our divert. Some time during this mess, I finally realized that the left quarterpanel was crystal clear. In fact, it was not there at all, which explained why the cockpit was so windy. I also noticed that my right leg was extremely hot because the air conditioning had tried to warm the ice cold cockpit. I turned the temperature control to manual and moved it to the cold position.

As we climbed, the left engine chugged several times, indicating probable FOD. We reduced power and the chugs stopped. We made repeated calls to Center and Approach. From what we heard on the radios, we knew they had an emergency aircraft on their scopes, and it was headed toward Smalltown; but, evidently, they could not hear our transmissions. As we continued toward Smalltown, we completed the NATOPS Damaged Aircraft Checklist. We also dumped down to single-engine landing weight, just in case the port engine failed. Aircrew coordination was hampered by the cockpit wind noise, and talking on the ICS was nearly impossible without shouting. I handed my pilot his PCL — his had flown out with his quarterpanel.

With Smalltown Field in sight, we turned to set up for a long straight-in approach. As we slowed to approach speed — 10 knots above on-speed from our damaged aircraft procedures — we were finally able to talk normally on the ICS. Our approach was hampered by the pilot's limited forward visibility and a left-to-right crosswind. He also had extremely limited visibility from the starboard windscreen for landing due to the seating arrangement of the A-6. I had to give him line-up and glideslope corrections. There was no arresting gear available.

After following a friendly follow-me truck, we parked and climbed out. We tried to pin the landing gear but didn't have any gear pins. Another bird had hit the outer edge of the port engine intake and traveled about 4 feet aft through the pilot's boarding ladder where the gear pins are stored.

The bird went through the No. 1 UHF antenna wiring, which explained some of our radio problems. Also, the auxiliary hydraulic system plumbing was ruptured and torn, which could have led to a combined hydraulic failure. Remarkably, the engine was not FODed. The chugs were caused by some torn engine PT lines. Cockpit damage included the shattered bulletproof — but not duck-proof — windscreen, the complete loss of the port quarterpanel, and an optical sight broken from its mount. As we continued to examine our aircraft, we watched a pool of hydraulic fluid developing on the ground. We realized it might have only been minutes before a hydraulic failure.

This incident happened more than a year ago. Looking back, we were helped by a thorough brief and situational awareness. We had briefed birdstrikes and divert fields, and we knew what we were going to do before something happened. Also, when you have a damaged aircraft, you can't always tell the extent of that damage. We suspected the port engine was FODed, but it wasn't.◄

Lt. Lindsay is a B/N with VA-155.

My First Cruise

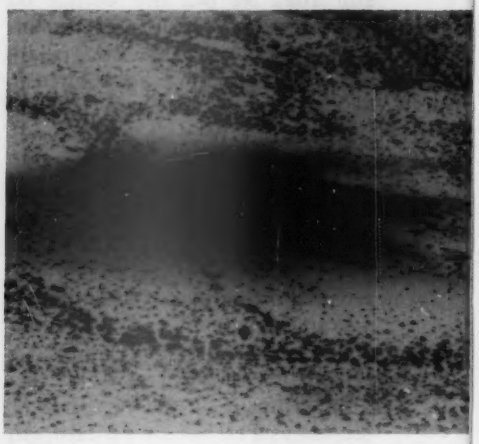
By Ltjg. M.A. Bryan

AS my first WESTPAC cruise drew to a close, a few memories came to mind, the first being the day I flew onto the ship to begin this six-month tour. Filled with apprehension and excitement, I was putting on my flight gear when I saw an old friend I knew from the RAG squadron. He was just coming off his first cruise, and his squadron would be taking over our hangar spaces.

We talked about the cruise and what I might expect at sea. He told me about day landings with visibility down to one mile because of blowing sand, of boring no-fly days at anchor and everything else he could remember about how crazy flying sometimes got at sea.

I also met another friend from the RAG in the same squadron, both now fleet-experienced aviators. I was jealous of their experience but knew it was just a matter of time before I also had a cruise under my belt.

As I prepared to man up my jet, the usual farewells were exchanged with a thoughtful wish to be careful out there. I knew this was what all the training was about: going to sea with the potential for dangerous flight ops and even some action if things heated up in the Middle East. I knew I was ready for it. I would just need to stay alert and fly my best every time I went off the pointy end.



My two friends just off cruise would be enjoying well-deserved barbecues and beers while I would be eating freeze-dried cottage cheese and drinking powdered milk. After all, they earned it. Now was the time for them to relax, enjoy life ashore with fun times at home and easy flying at work. As I said good-bye to them that day, it never occurred to me that I wouldn't see them again. In three months they would both be dead.

While on a training flight, their A-6 flew into the ground. They left their homes one day for a low-level bombing hop, the kind we've all flown many times before, except this time they didn't come back.

Two weeks later, another A-6 flew into the ground within 30 miles of their wreckage. Another two dead.

There is nothing spectacularly unsafe about the area where these men met their violent deaths. Perhaps that is what makes it even more dangerous. During preflight planning for a low-level, everyone knows where the steep rising bluff is located. That 14,000-foot peak is also easy to find on a chart. What about an ordinary rise in the terrain on the edge of the valley? We fly past these all the time. We're trained to fly through valleys during day and night, good weather and bad. So why did they die?

... While on a training flight, their A-6 flew into the ground. They left their homes one day for a low-level bombing hop, the kind we've all flown many times before, except this time they didn't come back ...

No one can ever know for sure, but it's obvious that even a routine flight can have disastrous results. I have flown that route many times and never noticed the location where they died.

I guess the old saying that no one ever gets killed on the dark and stormy night is true. When the danger and challenge of flying are apparent and visible, you reach a peak and are concentrating on your flying. That's not a dangerous time. What's far more dangerous is the lack of attention that creeps into a routine flight.

I've also heard that in this business you will have friends who get killed. Now I see that this is true, but I never realized that it could be done so casually. No AAA fire, no burning engines or bad-weather, single-engine approach. They just hit the ground.

The greatest lesson I take with me off my first cruise has nothing to do with flying around the ship. What I've learned is that any flight can kill you, even the most routine one. No one wants to man up a jet and worry about dying, but an alert attitude to the danger that is out there could perhaps prevent senseless mishaps.

Ltjg. Bryan is an A-6 pilot and LSO with VA-95, based at NAS Whidbey Island, Wash.

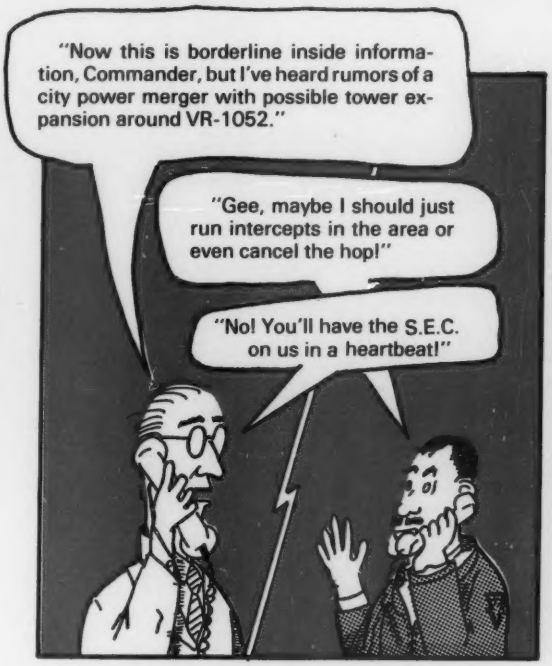
BROWNSHOES IN ACTION COMIX

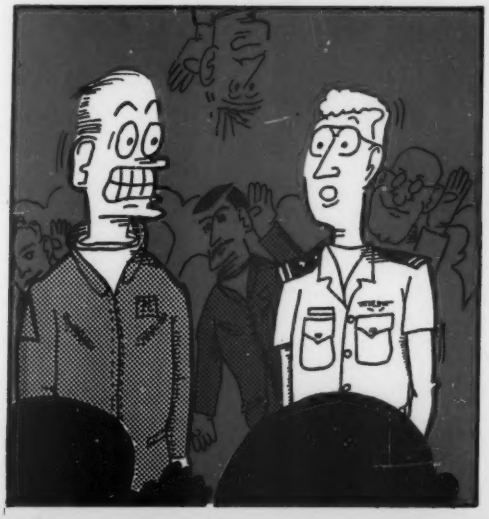
"The kind real aviators like"

By Lt. Ward Carroll

He looks like any other professional ambling toward work in the big city, but this man is special. This man is a CHUMS broker!

Fast-track aviators find him indispensable . . .


"Now this is borderline inside information, Commander, but I've heard rumors of a city power merger with possible tower expansion around VR-1052."
"Gee, maybe I should just run intercepts in the area or even cancel the hop!"
"No! You'll have the S.E.C. on us in a heartbeat!"



CHUMS . . .

Don't go low without 'em!

NAVY